THE
VETERINARY JOURNAL

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Biography

COLONEL ARTHUR OLVER, C.B., C.M.G., F.R.C.V.S.

VETERINARIANS will read with pleasure that a member of the profession has been selected to fill the important appointment of Expert Adviser in Animal Husbandry to the Government of India, and those who know Colonel Arthur Olver will agree that no better selection could have been made.

Qualifying from the London College in 1897 and entering the Army Veterinary Corps two years later, his military career took him through the South African War ; during which he was selected to fill an important post at Command Headquarters, Pretoria ; and afterwards to study under Sir Arnold Theiler at Daspoort until sent to the Soudan in April, 1906.

Here his endeavours to eradicate Cattle Plague in the Nile district met with such complete success that there was started, under Major Olver's direction, the cattle trade with Egypt ; which his colleague, the late Lt.-Colonel Ulysses Carr, eventually developed into one of the most paying industries of the country.

In 1907 Lt.-Colonel Olver was appointed Principal Veterinary Officer of the Egyptian Army and the Soudan Civil Veterinary Service, relinquishing this to become Assistant Director General at the War Office.

The Great War found him in France, where he occupied a number of important positions, including the command of one of the large Veterinary Hospitals and an Administrative post on Headquarters Staff under Major-General Sir John Moore. In June, 1917, he was selected to go to Canada and the United States of America as D.D.V.S. of the British Remount Commission, remaining until 1919 ; returning to Egypt as D.D.V.S. from 1922 to 1927.

Promoted Colonel in 1928, Colonel Olver went to India in 1929 as D.D.V.S. of the Northern Command, retiring in April of this year upon being selected to fill the important position which he now occupies, and in which it can safely be surmised he will win fresh laurels for himself and the profession whose interests he serves. It is a *liaison* post of the utmost value between Agriculture and Veterinary Science.

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Editorial

THE "OLD HORSE TRAFFIC" BOGEY, THE LAY PRESS, AND THE MINISTRY OF AGRICULTURE.

SOME years ago there was a very justifiable crusade, in which the general public and the Press, aided by certain members of the veterinary profession, took a prominent part, against the transport of old and decrepit horses across the seas to be killed for human food. The result was that in 1919 certain Government regulations were made, and the responsibility for their proper and efficient administration was placed on the Veterinary Department of the Ministry of Agriculture. That the confidence which was placed in those of our colleagues to whom these duties were entrusted has not been misplaced can be confirmed at any time by anyone who will only take the trouble to investigate the subject personally; and it is astonishing that statements such as the following have been allowed publication in such a reputable sporting paper as the *Field*, in which in the issue for December 28th last, a letter appears in which the correspondent states, under the heading of "British Horses Exported for Butchery," : "I am anxious to make the readers of the *Field* conversant with its horrors. As a nation we endeavour to uphold the cause of justice and humanity and to protect the oppressed, yet at the same time the appalling fact remains that the most cruel trade—the exportation of horses for slaughter abroad—continues to this day . . . . It is an actual fact that between 200-300 horses leave our shores every week and their fate when they reach foreign soil is in the majority of cases too ghastly to dwell upon.

"Whilst the poor animals await death they suffer from hunger, exhaustion and fear. Once condemned to death no thought is taken and no suffering appears to matter . . . .

"The pressure of public opinion alone will assure the suppression of this horrible traffic."

In the *Daily Express* for March there appeared a series of articles with such horrifying headlines as "What are they doing for our old Horses?"; "How the ghastly traffic could be stopped"; "Inhumane treatment on the Continent"; "Doomed to Slaughter"; and the Editorial pen was even inveigled into a paragraph under the heading of "A barbarous traffic."

Moreover, in the same widely read paper, the Royal Society for the Prevention of Cruelty to Animals was reproached for its surmised

apathy and lack of duty in not investigating and moving in the matter, and a letter from the Chairman was published in the issue of the paper for March 19th from which we quote that " the R.S.P.C.A. is at once having a further most careful and exhaustive investigation made," stating, too, that it is quite obvious that either the statement made by the Minister of Agriculture or the suggestion of the *Daily Express* correspondent must be inaccurate.

In the meantime a society known as " The International League Against the Export of Horses for Butchery " has taken the opportunity to issue leaflets by post and otherwise with headlines such as " Torture of British Horses in Continental Slaughter Houses " ; " Exposure of Ghastly Traffic " ; etc.

What are the actual facts ? So much has the subject been prominently brought forward before the public lately that the Ministry of Agriculture has found it necessary to take official action and, as members of a profession whose honour is involved and whose whole life is given up to endeavours to find methods of alleviating animal suffering, it will give pleasure to our readers to note the dignified tone of the reply issued. The following note was sent to the Press a few days ago :

" EXPORTATION OF HORSES.

" In view of the disturbing and misleading allegations made in certain recent newspaper articles concerning the export of horses for immediate slaughter, the Minister of Agriculture and Fisheries desires to give publicity to the facts, which are as follows.

" The law of Great Britain prohibits the shipment from this country of any horse unless it has been examined by a Veterinary Inspector of the Ministry immediately before shipment and passed as fit to travel and also to work without suffering. This prohibition is very rigidly enforced and the Ministry has not reduced in the slightest degree the high standard of fitness which has now for some years been adopted in respect of every horse passed for export. It may be accepted that no horse which could be described as decrepit or worn out is allowed to be exported.

" The recent newspaper articles could only have led the public to believe that 200 or more horses are sent to the Continent every week from these shores to be slaughtered at certain abattoirs in France under ghastly and cruel conditions, but nothing could be farther from the truth. Apart from the question whether the conditions at the Paris abattoirs referred to in those articles have been correctly reported, no horses have been sent there for slaughter from this country since 1925,

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so that those conditions have no relevance whatever to horses sent from Great Britain for slaughter.

" During 1929 the total number of horses passed for shipment to the Continent was 9,912. According to the information furnished to the Ministry's Inspectors at the ports at the time of shipment, 4,371 of these were intended for slaughter on arrival abroad, and all but 29 of the latter went to Holland where the use of the humane killer is made compulsory by law and where the public abattoirs are among the best in the world. The remaining 29 were all, according to the information received by the Ministry slaughtered with the humane killer at the Boulogne abattoir.

" It will be recalled that the export trade in horses was thoroughly investigated in 1925 by a Departmental Committee who reported that they were satisfied that the provisions of the Exportation of Horses Acts were efficiently carried out and that the closing of the Continental market to horses from this country passed as fit to work could not be justified on any grounds.

" Ministry of Agriculture & Fisheries,
" Whitehall Place, London, S.W.1.
" 27th March, 1930."

Furthermore, in the *Animal World* (the official organ of the R.S.P.C.A.) for this month (April) there appears the following :

" THE EXPORT OF HORSES

By Sir Robert Gower, M.P., *Chairman of the R.S.P.C.A.*

" The public has been shocked by suggestions recently made that ' two hundred or more ' horses are exported each week (i.e. at least 10,400 a year) from this country to the Continent for butchery and—or many of them—slaughtered there under shocking and inhumane conditions. In response to urgent requests made to those responsible for such suggestions, no evidence or information at all has been forthcoming from them in support of their allegations so far as the year 1929 or since is concerned. The investigation conducted some months ago by the R.S.P.C.A. failed to discover any foundation whatever for the suggested state of affairs. In reply to questions put to him, the Minister for Agriculture has definitely stated that during the year 1929 only 4,371 horses were exported to the Continent for butchery and that as the result of careful inquiries he is satisfied that all these horses were slaughtered by means of humane killers.

" The suggestion which has been made as to the fate of horses exported for butchery to Holland is clearly wrong. In Holland it is illegal for horses and other animals to be slaughtered except by means of the

humane killer and under humane conditions. The public abattoirs there where the large majority of horses are slaughtered are amongst the most efficient and best equipped in the world. The same law, i.e. the compulsory use of the humane killer for the slaughter of all animals, also applies to private slaughter houses and abattoirs in Holland and the Dutch Government has stated that it is strictly enforced. I wish the same law were in operation here.

" Having regard to the suggestions made regarding the alleged inhumane manner in which horses exported abroad for butchery are now slaughtered, the R.S.P.C.A., notwithstanding that those responsible have not up to now provided a scrap of evidence or a tittle of information to justify their suggestions, is at once having a full, exhaustive and impartial investigation made to ascertain whether those suggestions or the definite assertions to the contrary made by the Minister of Agriculture are correct. The result of that investigation will be published immediately it is completed. Any evidence or information which will assist in the making of the inquiry we shall be grateful to receive.

" In order, however, to allay public anxiety this interim statement is being made. The R.S.P.C.A. has always been and is fully alive to its responsibilities in the matter and is whole-heartedly supporting the Bill at present before Parliament so as to remove the possibility of British horses which are sent to the Continent for purposes other than butchery being ultimately slaughtered under satisfactory conditions."

Further comment is needless, except to wonder why a reputable lay press should have allowed such harrowing details to be issued to the public without having facts behind to prove them if necessary.

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General Articles

GENETICAL METHODS OF LIVESTOCK IMPROVEMENT.*

By PROFESSOR F. A. E. CREW, M.D., D.Sc., Ph.D.,
Animal Breeding Research Department, University of Edinburgh.

DURING recent years the agricultural community has been asking ceaselessly for immediate help, for subsidies, for import duties and the like, but invariably the Governments have seemed to reply that such pleas are both mistaken and ungrateful, for is it not the case that the State has so endowed and organised agricultural research that the grandchildren of the present generation of agriculturists must so profit that in their time there will be no problems but only universal agricultural prosperity? But one is not surprised to find that the agriculturists now living seem to exhibit but slight interest in the social circumstances of the generations yet unborn, or to learn that the remark of a former Minister of Agriculture, when addressing a branch of the National Farmers' Union to the effect that his Government was spending much money on research, evoked derisive laughter.

It would seem at first that the agriculturists are somewhat contemptuous of research. But really this is not so. They laugh, sometimes rather bitterly, because they cannot see how the research schemes organised by the State can possibly remove that which they regard as the root cause of the present calamitous conditions of agriculture, namely, the small or commonly non-existent margin between the cost of production and the price of the produce. They hold the view that nothing but the immediate increasing of this margin in favour of the producer can save the situation. It is for this reason that agriculturists receive proposals which in their opinion can have no immediate effect on the producer's margin of profit, with but scanty enthusiasm. It has to be recognised that never in all the history of agriculture in this country have the economics of breeding demanded more careful consideration than now. With the exception of the sheep alone, costs of production are high and returns are low; that arable farming is largely being replaced by grazing in order to reduce losses; that there is a distinct possibility that the sheep markets may become saturated; that the change in the system of farming may prove to be regrettable from the national standpoint; that the marketing of cereals will pro-

* Paper read before the Royal Society of Arts at 8 p.m. on Wednesday, April 9th. Sir Daniel Hall, K.C.B., D.Sc., F.R.S., Director John Innes Horticultural Institution, presided.

bably remain as unprofitable as it is at present and that the only sound policy for the British farmer would seem to be increased livestock production with the marketing of crops in the form of animal commodities, since, owing to the tastes of the British public, fresh animal products cannot, yet awhile at least, be affected by foreign competition. If, then, the aim of British agriculture is to be the production of standardised and uniform animal commodities, the time has come already for serious thought and action. But it is exceedingly difficult for the hard-pressed agriculturist to plan for the future whilst the present is so very full of gloom.

This being so, it becomes a matter of some difficulty for one who, like myself, knows full well that much time is required for the development and democratisation of the results of successful scientific investigation to talk enthusiastically of the benefits conferred upon livestock breeding practice by the science of genetics to a company of men whose anxiety is so profound and whose position is presently so insecure. I must remove all possibilities of misunderstanding by defining my point of view concerning the relation of the professional biologist in the service of the State to those whom he is meant to serve. The scientist is concerned with the disclosure of facts—verifiable scientific facts—and with the search for principle : the practitioner of agriculture is concerned with the weaving of these facts into the warp and woof of agricultural policies. It is for the scientist to advance knowledge ; it is for the agriculturist to transform knowledge into wise action.

Time was when tradition bequeathed by one generation to another was sufficient to command success in livestock breeding, but discoveries in fields of knowledge seemingly quite remote from farming have made the breeder largely dependent upon information that cannot be acquired on the farm. Nowadays tradition must ever be reviewed and commonly discarded. Advances in our knowledge of the principles of breeding, which are the substance of the science of genetics, have been such that to-day the actual value of a particular system of breeding is to be assessed only by one versed in genetical science, and no breeder can afford, even if he would, to neglect developments in this science, for progress in the techniques of breeding would seem to be possible only through the disclosure of relevant knowledge through scientific investigation and through the democratisation of this knowledge. But livestock breeding is much more than an adventure in applied genetics. The breeder is primarily a manager of a very complicated business, and it is expected of him that he shall be able to construct his own policy of breeding, to check the costs of production against the prices that he is likely to receive and to organise the application of labour. He must, moreover, be a man of live imagination, possessing

the ability to anticipate trends of development and to be alive to the values of the contributions that science has made and is making and to the power that it is placing in his hands. It is far too commonly forgotten that science is of assistance to the breeder only if he knows already the primary business of farming. It can be of help only if he is competent to apply its generalisations to his own particular circumstances. Science can contribute nothing unless the breeder is at all times prepared to jettison the old and to accept the new, to regard no method or system as immutable. It must be understood that no particular method is good in itself, but only in relation to prevailing conditions of markets, climate, soil and so forth, and that the only real test of the value of a method or a policy in breeding is that it shall yield a profit to the breeder in the circumstances under which it is practised. It follows, then, that much more than an understanding of genetical theory and an appreciation of genetical facts is demanded. The science cannot help the man who, through lack of vision or of money, cannot continually seek new methods and new policies, who cannot change his practice when markets change : it cannot help those who keep store cattle so long that they cannot compete in the end with the more suitable class of beef that comes from the cheaper grazing grounds abroad, nor those who breed unsuitable sheep which yield large joints and an abundance of fat, or those who sell the quickest growing sows and keep the slowest for further breeding, not knowing that the economical conversion of food into pig is an inherited character and that the quickest growers are the most economical feeders. The geneticist can help the breeder when the latter has stated his policy and has defined, more or less exactly, what he wishes to produce. The geneticist can discuss the methods of production, but the reasons for production fall outside his field.

The Standard of Excellence.

A definition of what the breeder wishes to produce leads at once to the construction of standards of excellence and thus to serious difficulty. These standards are necessarily complex, because it is impossible to concentrate on one or two qualities, such as meat or milk or wool production, and to neglect the animal as a whole ; the ideal animal must live, thrive and reproduce in a particular environment as well as provide certain animal commodities. Type is meaningless without reference to habitat and destiny. Another difficulty that stands in the way of standard making is that too commonly the general economics of production are complex ; for example, the destiny of a mountain breed of sheep may be the production of ewes for crossing with rams of a larger lowland breed in order to produce the best kind of fat lamb.

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The standard of the mountain breed in a case such as this is applied only to the female, for the function of the make is to produce females, whilst that of the lowland breed pertains mainly to the ram. Moreover, standards quite commonly cannot be consistent, since it may be impossible to obtain in a single animal the full development of all the desired points of excellence. The standard for males and females may be quite different, so that one flock or herd or strain secures a reputation for producing males of excellent type, whilst its females are not nearly so good. A special example of this is encountered in the cockerel-producing and the pullet-producing strains of such a breed of fowl as the Dark Brahma. Standards present great difficulty in their statement because of their elusive nature. Excellence can as yet be defined only in the vaguest of terms, and all too commonly it does not refer to the realities of structure and function of the animal body and its analysis in terms of inherited characters is quite impossible. Yet until excellence has been defined and measured, the science of genetics cannot offer much real assistance. Improvement implies an attempted nearer approach to the standard of the ideal. Obviously, therefore, before there can be intelligent attempts at improvement the standard must be defined and must be shown to be biologically and economically sound. But all too commonly the standards are set, not by the breeder, but by the buyer, who knows little, if anything, of breeding. For example, one hears a great deal to-day of the need for improvement of the fleece of the sheep, but the voice one hears is the voice of the manufacturer of textile goods, who apparently regards the sheep merely as a vehicle of a fleece out of which he is destined to manufacture socks and semits at a reasonable profit to himself. But the breeder has quite different standards : to him the fleece is a protective covering for the lamb and for the sheep, contributing to the development of such qualities as hardiness—the fleece must be of such a kind as will help his sheep to thrive, for he has to consider fertility, milk yield, growth rate and fitness in relation to the particular system of husbandry and to the geological and climatic conditions of his farm. The sheepbreeder in this country knows that mutton can always command a fair and steady price in the regional markets, whereas the fluctuations in the price of any particular grade of wool are profound and most unsettling. He therefore regards mutton production as the more important aspect of husbandry and wool merely as a by-product. Two sets of interests must be considered when drawing up the standard of the ideal, the breeder's and the textile manufacturer's, but of the two the breeder's must remain the more important.

From what has been said, it is seen that the ideal type is that which in virtue of its characterisation so harmonises with the conditions of

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husbandry that it achieves the fullest expression of its hereditary endowment and so fulfils adequately the destiny for which it was intended. Before any standard of excellence can be intelligently constructed there must be available exact information concerning the purposes for which the stock is to be bred and concerning the habitat in which it is to have its being. When this information has been given it becomes a fairly simple matter to define and to construct the type.

The Breeding of the Ideal Type.

Breeding is a synthetic operation, and before there can be intelligent controlled synthesis there must be analysis. One of the most urgent demands in animal breeding is the scientific analysis of excellence and a study of the interrelationships of the various characters which in their combination constitute the ideal and of the mode of their inheritance. The methods of improvement, through breeding, are simple and straightforward. Developments in genetical science have not changed them, but have merely refined them and have explained their success. A recognition of the broad fact that the majority of the component characters in any ideal type are dominant in the Mendelian sense and that the majority of undesirable characters are recessive enables us to understand many things ; for example, the facts that it is not to be expected that the progeny of a mating shall be of the desired standard unless the parents approach that standard ; that the greatest chance of obtaining an individual of excellence is provided when parents, excellent themselves, and related one to the other, are used ; that it is not uncommon for good parents to throw bad offspring ; that any culling must be carried out as a national scheme since the herd or flock is far too small a unit when uniformity of produce is sought ; and that inbreeding can give such diverse results since this system of mating is the quickest means of disclosing the hidden recessives.

There is only one sure way of improving the livestock of a country, and that is by improving the stockbreeder. This can be done by improving his education and by offering rewards for ability. At the present time the shows are not such important agents in livestock improvement as they were in days gone by, for far too much importance is given to standards which have no relation to economic worthiness : the showyard is somewhat blind to commercial realities and tends to encourage grossly uneconomical systems of husbandry. To-day the prize is too commonly given to the man who exhibits the best fitted animal and not to the animal that is the nearest to the ideal economic type. The fact that pedigree as an instrument wherewith to assess worthiness is not enough is not clearly recognised and the prize is too often given to the best looker and not to the best performer. The milk

record, the bacon quality, the pulling power, the egg record, the fertility record must overshadow the preferences of prejudiced judges ; judgment must be impersonal and based on a record of performance, on productivity, on thriftiness and resistance to disease before the shows can play their proper rôle in livestock improvement schemes. The milk recording schemes, the pig testing station, the wool yield test, the dynamometer, the laying trial, the premium schemes, which include considerations of fertility ratio and of prepotency, these are instances of the tools wherewith the standards of to-morrow are being fashioned in accordance with genetical fact, these are the instruments which are contributing to the education of the stockbreeder and which are the means by which he may hope to gain adequate rewards for the exhibition of vision and ability.

That which the enlightened individual, Bakewell, the Booths, the Collings, Bates, Cruickshank, Duthie, Watson, McCombie, Price, Hewers, for example, did and which " the white heifer that travelled " and " the Durham ox " did to show what good stock is and how to get it led inevitably to the rise of agricultural societies, the herd and flock book societies, all of them organisations for the protection, the improvement and the advertisement of stock. But the time has come when that which the society cannot do, the State must. Everywhere we see State intervention in the programmes of stock improvement and the genetical methods employed have been of two kinds, negative and positive. The negative comprise all those projects which have for the object the prevention of the spread of bad germ plasm among the livestock population of the country. There are in this country vast numbers of inferior animals differing from the superior in virtue of their hereditary constitution. Their characterisation is not hopelessly bad, but it is not so good as that of the others. Since manifestly it is sound policy to breed only from the best there is no point in propagating the relatively unsatisfactory. Further, since improvement implies the manipulation of hereditary constitutions it is eminently desirable that the pedigrees and performance records of all animals used for breeding shall be known. For this reason the use of the scrub bull—the unknown—must be discouraged and even prevented.

But besides the relatively inferior there are considerable numbers of animals in the livestock population of this country that carry in their hereditary constitutions factors corresponding to characters which are harmful to their exhibitors and which cannot easily be repaired. Lethal factors which lead to the development of characterisations that render their exhibitors non-viable are widespread and are responsible for much pre-natal and early post-natal death. Hereditary defects and derangements are common and can presently be removed only by the removal,

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by genetical methods of breeding, of the individuals carrying the factors corresponding to them. Possibly dominant lethals exist, but if so, then the individuals carrying factors for them die at a very early stage of development. Those that are recognised are recessives and in the simplex condition affect the viability of the individual either not at all or else but slightly, but cause death when present in the duplex condition. It is because such lethal recessives are fairly common that inbreeding is so dangerous. If the lethal character is expressed in the heterozygous condition its presence in the hereditary constitution of a stock can be recognised, but if it produces no visible effect when heterozygous, then its presence can be deduced indirectly by observing the absence of certain expected types among the offspring of a mating or by noting the occurrence of still births. Examples of the first group which produce a visible effect when in the heterozygous condition are the dominant yellow colour in the mouse, the hooding character in the canary and the bulldog calf. The occurrence of still births must always arouse the suspicion that a recessive lethal factor is at work and that this in the duplex state renders the individual non-viable. An excellent example of this is the case of atresia coli in the horse.

The problem of lethal factors links up with that of the record of performance. Ideally it is very desirable to test every stud animal for the presence of sublethal factors, and so only those sires which, when mated with their daughters, have produced a run of twenty normal offspring (of satisfactory performance) should be recognised for breeding purposes. Of course, such advice cannot be followed by the individual breeder, but the time will come, no doubt, when all uncastrated male domesticated animals of economic importance will be purchased by the State at killing price and kept alive until they have been thoroughly exposed to the progeny test. The State cannot afford to allow the sires to remain in private hands.

Positive methods of livestock improvement aim at the provision of stock of known genetic constitution and possessing an accurate record of performance. Such schemes necessarily involve considerable genetical analysis of standards and of stock. Most, if not all, premium schemes thus far developed possess little, if any, value, for the reason that no sufficiently comprehensive records have been maintained. Nor can they ever be until all licensed sires become the property of the State and the experimental material of the scientist. All State intervention of this kind assumes that breeders generally are either incapable of assessing the real value of an individual or individuals at all accurately, or else cannot, for financial reasons, provide suitable sires for themselves. This attitude is amply justified, for there is no indication that there has been any rapid multiplication of the very good

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animals, and a corresponding reduction in the number of the inferior animals in the livestock population in this country. The general level of excellence of the commercial stock of this country is pitifully low. One of the most urgent tasks to be undertaken is the remedying of this state of things. The very first step to be taken is the breeding of pedigree stock according to genetically approved systems of breeding. The next step is to grade up commercial stocks by means of pedigreed sires and to produce first crosses for certain commercial purposes by the use of two pure-bred stocks. It is highly probable that for the special purpose of meat production the first cross will always be used. But the production of the first cross with its hybrid vigour depends entirely on the pre-existence of two complementary or compensatory types of pure bred and the success which now attends, and will attend, this system of breeding depends entirely upon the existence and maintenance of pure-bred stocks that can be crossed with advantage. The uniformity of excellence of the first cross is determined by the genetic purity of the parental stocks. In this production of first crosses of exceptional economic worth, large numbers of pure-bred stock of the highest quality are needed. These latter are also absolutely necessary for the most important yet simple task of grading up the pure-bred commercial stock of the country. It would seem to be the case, moreover, that in those instances in which the desired production depends on an intensive degree of development of relatively simple single functions, such as milk or wool production the pure-bred is better than the first cross, and so for these purposes great numbers of graded pure-bred commercial animals are required.

It is accepted that every possible economy in agricultural practice must be effected. Yet one does not have to travel far to find extravagances, probably preventable. For example, there is reason to think that the average life of a dairy cow is not more than three lactations, that one-quarter of the dairy cow population of Scotland is replaced annually, that 40-50 per cent. of all mares put to the stallion each year fail to produce a foal. Surely these are matters of grave concern, for it has to be recognised that in all probability half this trouble is genetic in origin. At the present time we do not know what are the causes of this disposal of dairy cows before the reproductive phase of their life history is passed, but we may assume that 20 per cent. or more are disposed of because they have proved themselves to be genetically inferior animals. There is reason to hold the view that about 50 per cent. of infertile matings are due to genetic causes. It is known that defects and derangements of the reproductive system are inherited characters. Studies of the available records have shown that those stallions which have left but few foals, even though they themselves were from prolific

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sires, usually can claim relationship on the dam's side with individuals of low fertility. There is no doubt that low fertility, sterility, can be bred into a stock and that it is the soundest of policies to breed for fertility at the same time as one is selecting for other qualities of economic worth. The time must come when some standard of merit based on breeding record for mares, both in the show ring and in the stud book will be required. Regularity in breeding will be regarded as a highly-prized character, and the buyer will then be able to assess the fertility of the stock he buys and the menace of sterility will have been removed.

Breeding is the solid foundation upon which all schemes of improvement must be built; expert husbandry can do much, but it cannot transform the hereditarily deficient into highly productive stock. The need for improving quality and for lowering costs of production is pressing. It can be met very largely by breeding for increased productivity in order to lower costs of production and by breeding for quality in order to increase returns. For milk production the first essential is to have high producers, to choose a bull on his dam's record and not upon the record of his sire's dam, to discard low producers and their progeny and to attempt to raise the level of production of the high producers by selection and careful breeding. There will be no problem of surplus milk if the low producers are eliminated and the average yield thereby improved. It is not generally recognised that one cow yielding 1,000 gallons is as profitable to her owner as are five, each of which produce but 650 gallons per lactation. Improvement in beef production is not so simple a matter for the dairy industry is responsible for the presence of great numbers of unsatisfactory stores. But the use of a good beef type sire for the unwanted calf of the dairy cow would do much to relieve the situation. It is in this connection that the scrub bull is at present so serious a menace. In the case of the pig, present-day opinion is definitely wrong in that it is commonly held that feeding and general management are the all-important factors in the attainment of success. This is not the case, as the records of any pig-testing station will show. Breeding (the hereditary constitution) affects the economics of commercial pig production in that prolificacy, economical conversion of food into pig, early maturity and the quality of the finished commodity are certainly inherited characters.

These, then, are some of the problems which have to be investigated and solved by the breeder and geneticist working in harmonious collaboration—the definition of standards, the analysis of excellence, the purification of stocks, the removal of the menace of sterility. The geneticist is completely ready to place his specialist knowledge of the fact and of method at the service of the industry, but the agriculturist

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is not yet ready to take advantage of the proferred help. Before this can become really effective, there must be new attitudes exhibited; the breed societies must begin to think nationally as well as scientifically, standards must be modified, stud, herd and flock records must be far more comprehensive and must include the worst as well as the best, for failures are as important as successes in genetical analysis. It will be regrettable if the practitioner turns to the science only when forced to do so by financial anxiety, for science can give the joy of understanding and the thrill of power, which are contributions no less valuable than those which pertain to the materialities of existence.

The Future.

Though it is unwise to prophesy, it is permitted to exhibit reasonable expectation. During recent years work in the field of endocrinology has been exceedingly active, and to-day we are in possession of a great body of scientific fact which bears very directly indeed upon the problems of livestock breeding. If we examine these problems, we find that they refer to the phenomena of growth, fecundity, fertility, lactation and metabolic rate. It is in respect of these that the good type differs from the bad. Moreover, it is differences in the rate of growth, ultimate body size, the degree of fertility, the duration and intensity of lactation and in the level of metabolism that distinguish the present-day domestic stock from their wild progenitors. Now it is established beyond all doubt that differences in these characters are directly referable to the action of certain endocrine glands, especially to that of the pituitary. We know that the elaborated products of this gland determine the rate of growth and the limit of growth, the number of eggs available for fertilisation, the intensity and duration of lactation and the intensity of the metabolism, and, also, working through the thyroid and the sex glands, the local deposition of fat. It would seem, then, that what artificial selection and controlled breeding have done has been to isolate and develop strains of animals remarkable for certain types of pituitary, thyroid and sex gland functioning. Reference to the various types of man produced by the various kinds and grades of disorder of these ductless glands will reveal every type of domestic animal of economic importance. That which is abnormal in man is the standard of the ideal among his animals. If this is so, we may assume with confidence that the future will see a very widespread application of the facts of endocrinology to the problems of animal breeding. That which presently is attained only by the exceedingly slow process of selective breeding will be achieved in each generation by the administration of the appropriate endocrine product prepared by the biochemist. The rate of growth, for example, will be controlled by the administra-

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tion of the appropriate pituitary preparation ; other preparations will be used to control fertility, fat deposition and so forth, and then the breeder will not depend for success upon his incomplete control of the somewhat blind forces of Nature, but will have the power to do whatever he will through his ability to supply to the animal those substances which control all those vital processes which are concerned in the development of qualities of economic worth. The lag between demonstrated scientific fact and its incorporation into practice is usually about 20 to 50 years. All these things can be done at the present time in the case of animals of no economic importance, such as the rat and the mouse. Surely, in this country, there must be those who would wish to see this work extended without delay to the horse, the cow, the sheep and the pig. But the fact is that there is no research institution in this country that is in a position to undertake such work, nor will there be until the livestock industry becomes aware of the promise that this work offers and demands that those scientists who are enrolled in its service shall be provided with the means to work with the animals of the farm and not solely with animals that the livestock-breeders would call vermin.

ABSTRACTS RELATING TO THE VETERINARY SERVICE FROM THE REPORT OF THE AGRICULTURAL COMMISSION, HELD SEPT. 16th TO OCT. 22nd, 1929, ON KENYA COLONY.

THE Commission was constituted to consider and make recommendations with regard to :—

(1) The progress of the main branches of the agricultural industry (including native agriculture and stock) since 1920.

(2) Factors which tend to retard progress, if any, and the means whereby production may be increased and accelerated.

(3) The provision which should be made for augmenting departmental or other services calculated to advance the industry and the share, if any, which should be borne by organisations or undertakings representing or concerned with agricultural interests and production.

(4) The formation and function of advisory, consultative, or other bodies, in connexion with the agricultural industry.

2. The Commission commenced its sittings on the 12th September, 1929, and, after two preliminary meetings, sat continuously from the 16th September to the 22nd October, 1929.

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The bulk of the evidence was taken in Nairobi but the Commission also held a session at Mombasa on the 7th and 8th October, and held Public Meetings at Nakuru, Eldoret and Kitale on the 26th, 27th and 28th September respectively, at which all sections of the community were invited to express their views within the terms of reference of the Commission. Amongst the witnesses who were specially called to give evidence, were Major the Hon. H. H. Brassey Edwards, M.R.C.V.S., Chief Veterinary Officer and Capt. R. Daubney, M.Sc. (Wash.), M.R.C.V.S., Acting Chief Veterinary Research Officer.

11. The Minister would become the representative to the public of his Department. He would represent his Department on all general administrative committees in which agriculture was concerned. He would thus shield his executive officers from the too frequent calls that have hitherto been made on their time. From some quarters it was represented that a Minister would be able to effect a desired reorganisation which would separate the Veterinary from the Agricultural Department and possibly Research from Administration. The Minister then would co-ordinate the work of these sub-departments with more authority than a Civil Servant can exercise over his colleagues.

16. *After due consideration the Commission recommends the setting up of a body to be called " the Board of Agriculture and Development."* It submits for fuller consideration the following suggestions as to its constitution :—

(*a*) The Board should be small in numbers, say, nine as a maximum.

(*b*) The members should be nominated by the Governor after consultation with the unofficial members of the Legislative Council. Members should be chosen for their experience of the agriculture of the Colony, native or non-native, and their judgment in affairs.

(*c*) The Governor shall be the President of the Board, the meetings of which should take place at least four times a year. A chairman, who shall be an unofficial member of the Legislative Council, shall be appointed from among the members of the Board, to act in the Governor's absence.

(*d*) The Director, the Deputy Director or Directors, and such heads of branches as may be desired, shall attend the meetings, but shall not be members of the Board. When any questions of native agriculture are involved the pertinent administrative officers shall be invited to attend.

(*g*) The Director will submit from time to time reports on the progress of specific undertakings, and the heads of the

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Divisions of Animal Husbandry, Veterinary Services, and Veterinary Research, shall regularly report to the Director for submission to the Board, in order to ensure the fullest co-ordination of effort in this field.

The Department of Agriculture of Kenya would be the first to plead, as it is in the best position to know, its inadequacy to cope with all the problems with which it is faced. The following comparison of the total expenditure on agricultural services relative to the value of agricultural exports for such Colonies of which the statistics are immediately available will show that the Government of Kenya has dealt with agriculture not less liberally than other similar countries :—

List Showing Agricultural Exports, Together with Costs of Agricultural Departments for Various Countries.

Country	A	B	C	D	E Ratio	
	Expenditure	Revenue	Net Cost	Value of Agric. Exports	A–D	C–D
	£	£	£	£	%	%
1928—Kenya (Agric. and Vety.)... ...	152,565	33,338	119,227	2,839,492	5.35	4.2
1928—Uganda (Agric. and Vety.)... ...	67,208	15,730	51,478	3,395,267	1.97	1.5
1928—Tanganyika Territory (Agric. and Vety.)... ...	102,381	5,220	97,161	3,807,081	2.68	2.54
1928—Nyassaland (Agric. and Vety.)	14,421	...	...	675,668	2.07	...
1927-28—S. Rhodesia (Agric. and Vety.)	126,900	...	...	1,970,000	6.45	...
1925—Fiji (Agric. and Vety.)	40,320	...	...	2,107,014	1.894	...
1928—Ceylon (Agric. only) (1 Vety. Officer only)	93,691	8,268	85,423	27,400,000	0.34	0.312
1926— Trinidad and Tobago (Agric. and Vety.)	38,166	21,466	16,700	2,658,942	1.43	0.64
1928—British Guiana (Agric. and Vety.)	17,997	618	17,379	2,091,453	0.86	0.81

The organisation the Commission conceives to be necessary would be somewhat as follows :—

The Department should be divided into two main sections, one dealing with crop husbandry, and the other with animal husbandry as a whole and co-ordinating the work of the field veterinary division, the veterinary research division and livestock activities generally. The senior officer in each of the two main sections should be given the status

of Deputy Director and should act as a co-ordinating officer for his respective section.

The Deputy Director, on the stock side, might be either the Chief Veterinary Officer or the Chief Veterinary Research Officer or the Chief Animal Husbandry Officer, as dictated from time to time by seniority and personality, whilst the Deputy Director of the crop husbandry section should be appointed from among the existing staff, subject to an officer being available possessing the requisite personality and experience.

The Commission is informed by the Director that he has long desired some such organisation but has hitherto been unable to submit proposals to bring it into effect, partly from reasons of economy and partly from personal considerations. *The Commission is of opinion that such reorganisation should be effected at the earliest possible moment.* It would point out that under the present system an occasion has arisen on which both the Director and the Deputy Director were absent from the Colony at the same time.

With the two Deputy Directors, each in charge of a Division, the Department need never be left without a responsible head, and better co-ordination can be effected within the divisions.

Division of Animal Husbandry.

A proposal has been submitted to us to create a separate Department which would remove all animal questions from the Agricultural Department. The Chief Veterinary Officer urges that his Division, including research, constitutes both as to expenditure and staff, the larger half of the existing Department, and that he is entitled to deal independently with Government, whereby he would be able to obtain a more adequate consideration of the needs of animal husbandry. He would call his Department " The Department of Animal Health," but its function would be the more general one of the promotion of animal production and he would require the services of officers trained in animal husbandry.

The Chief Veterinary Officer supports this proposal by a reference to a recommendation of a Committee of the Colonial Office presided over by Lord Lovat, which was appointed by the Secretary of State to inquire into the Colonial Veterinary Services in July, 1927, and which recommended that, in these services, the Veterinary Department should be separated from the Department of Agriculture.

The Chief Veterinary Officer suggested that any co-ordination which might be required between his proposed Department and the Department of Agriculture and any settlement of disputes which might arise between the two Departments, since both would be dealing with

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the same farmer, should be effected by the Colonial Secretary or even by the Governor.

The Commission rejects this proposal ; it cannot conceive of a Department of Agriculture which does not embrace stock and stock farming as an essential part of its activities. It holds strong views as to the necessity of promoting mixed farming as the essential basis upon which the agriculture of the Colony must eventually be built, and the help which Government can render in moving towards this end will be impeded if it becomes the function of two Departments. The creation of two Departments would immediately necessitate the setting up of machinery to co-ordinate their activities and this co-ordination is most readily and economically secured within the Department of Agriculture itself.

With regard to the recommendations of Lord Lovat's Committee, the Commission would point out that none of its members, nor the witnesses it examined—with one exception—had any experience of agriculture or agricultural administration.

This demand for the creation of an independent Veterinary Department has been before the Colony for a long time and, in the opinion of the Commission, it is time the controversy should be definitely closed.

While the Commission is opposed to any separation of the animal services, it does consider that there is need for more formal co-ordination of the branches of the Department which deal with animals. Statements have been made which show some lack of contact between the field services and the research branch. Again, there are indications that the field services operate at times without due consideration of the needs of the producing side of the industry. These statements, perhaps, fail to recognise the informal co-operation which always exists amongst officers of a small Department. To a large extent men may always be trusted to work together without any over-elaboration of organisation and the Commission has evidence from the Director that no work regarding animal husbandry is initiated without receiving joint consideration from the officers concerned.

The Commission, however, considers that this matter demands more formal measures to secure the fullest contact between animal husbandry, veterinary administration and research. It proposes therefore that there should be a quarterly meeting between the branches concerned, at which each should submit a brief progress report, together with any proposals for joint action in the interests of the industry.

So important does the Commission consider this conference that it

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would ask the Governor to initiate it and from time to time to preside over the meetings. Alternatively, if effect is given to the Commission's recommendation to set up a Board of Agriculture, this conference might take place as part of the proceedings of that Board.

In considering the development of the stock industry, the question at once arises of the direction in which the Department may most fruitfully work. As with crop husbandry, there are two points of view : one considers that the Department should concentrate upon research ; the other feels the need of carrying not merely the results of research, but such ordinary practical information to the settlers as may assist them in the conduct of their business.

Acting on the latter point of view, the Department has recently appointed a Livestock Officer who is a specialist in dairying. This officer has hitherto been occupied in making himself acquainted with the conditions prevailing in the Colony, after which he will be moving about from place to place, in order to give advice and technical assistance to the settlers engaged in the dairy industry. The appointment of a similar officer, specialising in sheep and wool questions, is also in contemplation.

The Commission recommends that an inquiry into the value of the system of advisory officers of this type should be undertaken by the Board of Agriculture at the earliest opportunity, since evidence on the point is conflicting. Further, there are other problems facing the stock industry which cannot be overcome without investigation. The research department at Kabete is occupied with questions of disease and hygiene and, though considerable developments may there be expected, it is probably not the place suitable for investigations into matters of nutrition or breeding, or the practical handling of stock. *While the Commission is not prepared to recommend the immediate establishment of an experimental stock farm, it considers that the question should receive consideration when the experiments now being conducted on behalf of the Rowett Institute on the Government Farm at Naivasha are terminated.* Much still remains to be ascertained on such questions as the value of indigenous grasses, the establishment of improved pastures, the use of licks and supplementary foods. Again, the improvement of the indigenous breed of cattle by selection and by better handling, by crossing either with European breeds or possibly by the introduction of Afrikander or Indian sires, is still in a rudimentary stage. Some information on these points will accrue from the experiments now in progress at Ngong, and this will be helpful in a few years' time, when the question will come up for review.

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Clinical Articles

A Modified System of Carrel's Method of Treatment for Infected Wounds in Large Animals.

By C. WENTWORTH ELAM, M.R.C.V.S., D.V.H.,
Liverpool University.

DURING the late war many surgeons were deeply interested in the excellent work carried out by Dr. A. Carrel and Dr. G. Dehelly, for they proved that by suitable antiseptic treatment septic wounds could be sterilized.

After a careful study of their method of dealing with infected wounds I decided at first that it would not be practicable in many cases in veterinary practice. Small animals would not submit themselves to such a method without continuous restraint, while with the horse or cow, although these animals may be placed in slings and readily submit to the treatment, the expense incurred would not justify its application in many cases. Moreover, these two doctors state that the application of their principles constitutes a " method that is to say an entity no portion of which should be altered at random, otherwise deplorable results may follow." In spite of this I decided to experiment in the hope that it may be found possible to so modify their system of dealing with infected wounds that it could at least form a useful and economical method of treatment in similar cases in veterinary practice.

Every practitioner is aware that such cases as septic arthritis, deep penetrating septic wounds, poll-evil, etc., are often troublesome conditions to treat, and that the methods of treatment generally adopted are often too costly and prolonged, while at times they are impotent to check the progress of infection. If it were possible to arrange an apparatus, whereby a continuous stream of a suitable antiseptic solution were made to pass through the infected area, healing would be greatly facilitated.

All noxious exudates which form in the area would be immediately flushed out together with pus producing organisms and their toxins.

The continuous removal of these irritants and toxins would not only reduce the tendency to secondary septicæma, but would remove the main factors which tend to retard the healing process.

Water as a Substitute for Dakin's Solution.

To substitute ordinary water from the main for Dakin's solution may, at first, appear to be a ridiculous procedure, yet, irrespective of

the properties of these two agents as regards their bacteria destroying powers, both act equally well as flushing agents in this method of treatment. It must be admitted that Dakin's solution is the ideal one to use for purposes of irrigation, yet cold water possesses a number of very useful properties.

(1) Its cost is practically nil. It can be obtained from the main as a continuous supply and by means of the tap perfect control can be exercised in its application ;
(2) It does not damage the tissues to any appreciable extent ;
(3) It acts as a vasa-constrictor allaying inflammation and lessening the tension in the area ;
(4) By virtue of its low temperature it acts not only as a mild local anæsthetic relieving pain, but also as a mild antiseptic inhibiting to some degree the multiplication of organisms in the past and reducing the temperature in the affected area.

Before describing the technique and clinical application of the various procedures comprising this simple method of treatment, it cannot be too strongly insisted upon that to obtain successful results the most careful attention to details of technique is essential if success is to be attained ; it is to neglect of such details that disappointing results may follow.

Apparatus Required.

The apparatus I use consists of a piece of metal tubing which is strapped on to the near or off forearm in the manner indicated in Figs. 1 and 2. The lower end of the tube is sealed while the upper end is open and here the hose pipe from the main is attached by means of a special screw. The metal tube is perforated on its outer side by 9 to 12 circular openings, each having a diameter of $\frac{1}{4}$ in. From each of these openings small metal tubes, $\frac{1}{2}$ in. in length, project. The ends of these tubes are closed by means of screwed

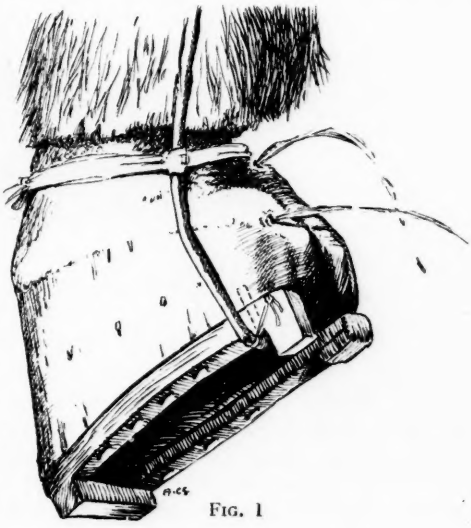

FIG. 1

caps. To these small metal tubes, rubber tubing (the length of which depends upon the distance of the wound from the forearm) may be attached. The number of rubber tubes used depends upon the character of the wound to be treated. If the wound required 6 tubes to ensure thorough irrigation, 6 screwed caps would be removed before attaching the tubes, while the remaining 6 caps would be left in position.

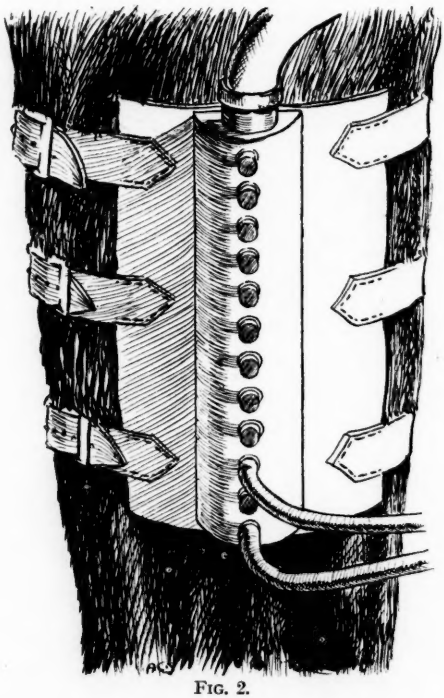

FIG. 2.

Method of Application.

In every case it is essential that the stream shall reach all parts of the wound. In some cases, therefore, it is necessary to make one or more openings in the adjacent tissues to serve as suitable exits for the stream.

When the surgeon is satisfied that the tubes can be inserted into the various openings in the skin so that no part of the wound will escape the action of the stream, the animal is placed in slings and the apparatus attached to the forearm. The hose pipe and the required number of tubes are fixed in position and the latter carried to the wound and

inserted into the various openings to the desired depth. These tubes are held in position by special clips or by means of tapes attached to each tube just outside the opening of the wound, the tapes then encircling the limb or body so as to prevent the tube slipping out of the opening.

The water supply is now turned on, with the result that the stream of water irrigates the wound.

I have adopted this method of treatment in many cases of deep infected wounds and septic arthritis with success, but it is essential that irrigation should be carried out as soon as possible and before definite evidences of secondary septicæmia have made their appearance. In several cases the wound was subjected to a continuous irrigation by various antiseptics. This was accomplished by allowing a concentrated solution of the antiseptic to slowly enter a small aperture in the hose pipe while the stream of water was passing through the pipe. The benefits obtained by using these solutions were in some cases a little more marked.

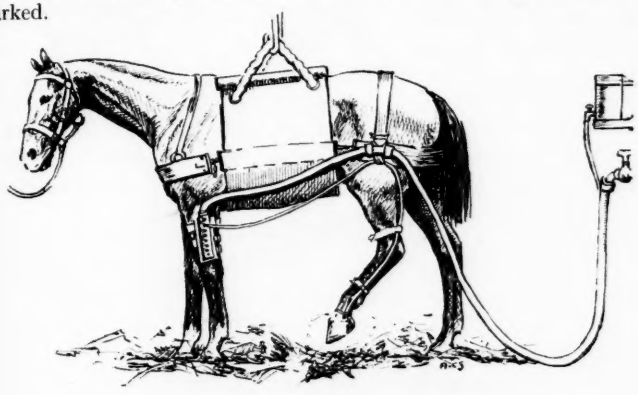

FIG. 3.

History of Two Cases Treated.

Case 1. An aged shire mare recently foaled had picked up a nail, the nail having entered the foot midway between the point and base of the frog. The usual treatment was adopted, yet in spite of this treatment pus and synovia continued to flow from the opening. The mare was now suffering acute pain and was unable to place any weight on the affected limb. She showed little inclination to take food, her milk secretion had diminished, while synovia was now flowing from two openings just above the bulbs of the heel. The mare was placed in slings and the apparatus applied. In this case only one tube was used, this being fixed as in Fig. 3, so that the water entered the lower opening

and after flushing out the wound, found exit at the two openings above the bulbs of the heel.

The wound was irrigated in this manner continuously day and night for 6 days. At the end of this period the acute pain had subsided and the mare frequently placed her weight on the affected limb. The general constitutional symptoms had become far less marked while the flow of pus and synovia had diminished considerably. This method of continuous irrigation was carried out for another 4 days, the force of the stream being diminished each day until the flow of synovia had ceased and the patient was able to be taken from the slings and exercised. The apparatus was then removed and the wound

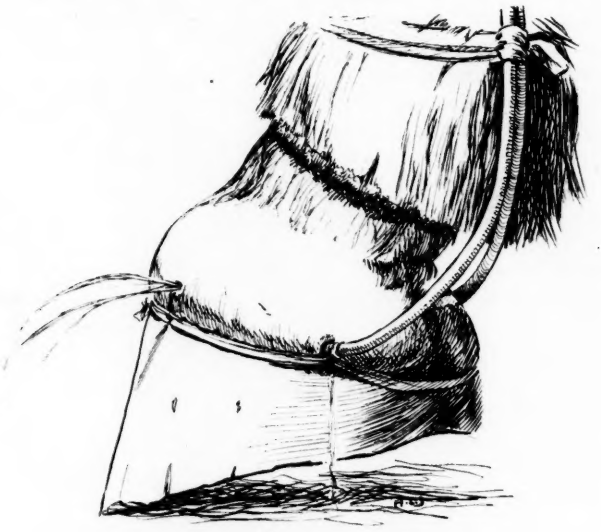

FIG. 4.

treated with eusol. The region below the pastern was clipped and dressed daily with Vetoid for 10 days when the animal was passed out to work. The mare worked for 5 years after treatment and showed no evidence of lameness. She was eventually destroyed on account of old age and inability to work.

Case 2. A shire gelding, 7 years of age, suffering from the effects of a neglected quittor. The animal had been placed in slings and poulticed by the owner for 7 days. On visiting the patient I found a condition of septic arthritis of the coffin joint. The animal was suffering acute pain and resting the limb continuously. The coronet was swollen considerably and pus and synovia were flowing from two

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openings posteriorly. An opening was then made in the coronet midway between these two openings (see Fig. 4) and the apparatus was applied.

Two tubes were used for purposes of irrigation, the streams entering the area through the two posterior openings and finding exit at the newly made opening anteriorly. Treatment was continued as in the previous case and the patient was passed fit for work 4 weeks after the commencement of treatment.

The Treatment of Septic Arthritis by Continual Irrigation.

By A. C. SHUTTLEWORTH, B.V.Sc., M.R.C.V.S.,
Liverpool.

On the 15th of January application was made for the admittance of a mare to the Liverpool University Veterinary Hospital. The animal was too lame to walk and was conveyed by ambulance. When received great difficulty was encountered in transferring her to the support of the slings, the pain in the off hind limb being evidently extremely acute. Examination showed an animal of the light Vanner type, probably sixteen or seventeen years of age, and in very poor condition. The off hind foot was persistently raised from the ground, and palpation of the swollen pastern region caused much distress. On the inside of the pastern were two openings which exuded pus and synovia. Injury, the type of which could not be determined, had occurred three weeks before, and there had been no treatment excepting that carried out by the owner, and which consisted of antiseptic baths and bran poultices.

Having seen practical evidence of C. W. Elam's irrigation treatment for septic arthritis it was determined to apply it to the present case. There was, however, little expectation of saving the mare, as discouraging signs of the imminence of toxæmia were already in evidence.

A water system was arranged from an adjacent tap by means of a rubber hose-pipe, and a smaller calibre tube led down to the foot. The tip of the tube was inserted deeply into the more anterior of the two fistulæ and the water was turned on. A powerful stream of water was seen immediately to emerge from the posterior drainage opening.

On the following day, as there was a possibility of incomplete flushing of the whole of the articular surface, a further opening was made on the outside of the limb, and a tube inserted into this. By this means a flush of water passed from side to side of the joint, thus diminishing the possibility of small areas being missed. On the third day of uninterrupted irrigation, the mare commenced to rest the foot,

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and several times made tentative efforts to place weight upon it. On the fifth day, the leg was being carried well beneath the hindquarters and the mare undoubtedly using it to take some of her weight. Unfortunately, concurrently with the improvement in the limb, unmistakable signs of pulmonary complications set in. By the seventh day her condition was such that destruction was carried out.

Despite the unsatisfactory termination of this case, I am convinced that the mare would have recovered under the treatment applied, if an early application could have been made.

I think that the chief benefit bestowed by the irrigation is the mechanical removal of organisms. After the first flush of water, the capsule should be free of its infected contents, pus and synovial fluid heavily impregnated with organisms. Afterwards, the bacteria swept through with the water, occupy the joint cavity for so brief a period that it might be termed cleansed almost to the point of being sterile.

Simple joints present no difficulty, as a direct through and through flushing can be arranged. The more complex articulations require more care as narrow offshoots and pouches are insinuated between adjacent bones and ligaments. The stream of water simply passes the mouths of these parts, and they remain as a source of re-infection when the stage of closure of the capsule arrives. If these diverticula are approachable from the exterior, tubes can be led directly into them. If not, as applies to the fringes of the carpal capsules, attempts may be made to force them open by means of the water pressure. It is suggested that a system of antiseptic solution be temporarily included in the flushing apparatus. The inlet tube must be firmly held in position and the outlet closed by firm pressure. The increasing internal pressure will force apart the articular surfaces to the limitation of the controlling ligaments and tend to open the mouths of subsidiary diverticula. Movement of the joint at this time will assist in disentangling any adhering points.

The normal position of a painful joint, that is, limply suspended, allows the articular surfaces to draw apart and gives an uninterrupted passage to the flow of water.

The Use of Calcium Gluconate in Milk Fever.

By J. F. D. TUTT, M.R.C.V.S.,
Winchester.

THE following is a report of five cases which have been treated with this preparation :—

Case No. 1. Guernsey Cow. 4th Calving.

This cow was seen first on January 20th last. She was not due to

calve for three weeks. When first seen, she was staggering round the box, falling down, and then getting up with difficulty. Constipation was present. Temperature 100.8.

The udder was inflated with oxygen and suitable medicine prescribed. She was seen later by my assistant, who found her down and unable to get up. He administered 8 c.c. of sol. adrenalin intravenously. I saw her again, later in the evening, and as she had become quite unconscious, I again inflated the udder and gave a hypodermic injection of atropine as recommended by Steffen. Her temperature was then 98.

She was seen again early the following morning, and I gave her 50 c.c. of adrenalin intravenously, and 1 grain of strychnine hypodermically. After this visit I telephoned to London and obtained a supply of calcium gluconate. This was not available for use until 4 p.m., when I gave her 375 c.c. subcutaneously and again inflated the udder. A further injection of adrenalin was given intravenously (50 c.c.). Temperature had now fallen to 96.

I saw her again at 9 p.m. and found no improvement, so 250 c.c. of calcium gluconate was given intravenously and 125 c.c. subcutaneously. The following morning at 7 a.m. I saw her again and the owner told me that she had become conscious for about 2 hours at 2 a.m., but after that had again relapsed into unconsciousness. Her temperature at 7 a.m. had risen to 101.2. I had run out of gluconate, so an intravenous injection of medical glucose (5 pints) was given, and a large injection (500 c.c.) of normal saline subcutaneously.

At 11 a.m. there was an improvement, the cow sitting up and apparently normal, except for inability to get up. Temperature 101.8. At 3 p.m. she again became unconscious, and although 5 ampoules each of 125 c.c. of ca. gluconate (a fresh supply having come through) were given subcutaneously, she died at 5 p.m.

Case No. 2. Shorthorn Cow. 5th Calving.

This cow had an attack of milk fever last year, and recovered with mammary inflation only.

Feb. 6th. Udder inflated with oxygen. Cow was not down, but was very staggery.

Feb. 7th. Three visits were made on this day. Cow had become unconscious. 3 tubes each of 125 c.c. gluconate given (125 c.c. intravenously, rest subcutaneously).

Feb. 8th. Death.

Case No. 3. Guernsey Cow. 5th Calving.

There was a history that this cow had had an attack of milk fever

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at her third calving, but got over it rapidly after mammary inflation with oxygen.

Feb. 15. Three visits were made—this cow was unconscious when first seen, and complete consciousness was never observed throughout her illness. 250 c.c. of ca. gluconate were given subcutaneously by my assistant who saw her and treated her at the onset. He also gave 1 ounce of adrenalin intravenously.

Feb. 16. No improvement, udder inflated, 125 c.c. ca. gluc. intraven.

Feb. 17. Ditto, 125 c.c. ca. gluc. intraven., 125 c.c. subcutan.

Feb. 18. Partially conscious. 5 125 c.c. ampoules given intravenously. The cow seemed brighter in three hours, but then again became semi-comatose, and late that evening three more ampoules were given intravenously and the udder again inflated.

Feb. 19. Death.

Case No. 4. Jersey Cow. 4th Calving.

The stockman had pumped the udder up with air earlier in the day, but as she was still staggery in the evening, sought professional advice.

March 21. Udder inflated. 125 c.c. ca. gluconate given into the gluteal muscles. The subcutaneous and intravenous methods were rejected, in an endeavour to see if any better results attended the use of it if given intramuscularly.

March 22. No improvement. 250 c.c. ca. gluconate intramuscularly, 20 c.c. adrenalin intravenously. Two udder inflations.

March 23. 375 c.c. ca. gluconate (250 c.c. subcutaneously, 125 c.c. intramuscularly). No improvement followed.

March 24. 125 c.c. intramuscularly. No improvement.

March 25. Death.

Case No. 5. Jersey Cow. 6th Calving (as far as could be gathered).

This cow was not down when seen, but was staggery. Calving had taken place 12 hours before.

March 27. Udder inflated. 125 c.c. ca. gluconate given into the gluteal muscles.

March 28. No improvement. Cow down and unconscious. 250 c.c. ca. gluconate given into gluteal muscles and udder again inflated. No improvement was followed by this treatment, and this being the 5th successive case treated with ca. gluconate, it was discarded and another preparation tried, which caused recovery. I am not at liberty at the moment to state what this was, but I am perfectly certain that continuation with ca. gluconate would have been attended with the

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same unsatisfactory results as in the other cases. This was the easiest case of the five, and if this preparation of calcium was of value, it should have put this case speedily right, whereas instead of that, the cow got rapidly worse.

Conclusions.

1. That in the cases of milk fever in which calcium gluconate has been tried, it has been a distinct failure.

2. Assuming that these cases were not due to a hypocalcæmia might not the use of calcium gluconate have aggravated the condition instead of curing it.

3. Assuming that these cases were true milk fever cases, the use of calcium gluconate should have expedited recovery.

4. If these cases were not cases of milk fever :—

(*a*) What were they due to ?

(*b*) How can the practitioner quickly distinguish between true milk fever and cases which are not milk fever ? A rapid and reliable blood test would appear necessary, but is not always practicable when miles away from home.

5. That assuming that these cases are not milk fever, then there exists in milk cattle after calving a condition that is clinically indistinguishable from milk fever, until it is noticed that there is no improvement after mammary inflation with oxygen or air.

6. That in cases which do not respond to mammary inflation the use of calcium gluconate is of no value, and that a different treatment may yield satisfactory results.

7. That such cases may be due to some remote cause (kidney disease for example).

Fractures of Both Femurs in a Heifer.

By CAPTAIN E. J. LAINÉ, M.C., M.R.C.V.S.,
Guernsey.

A FEW days ago, I was called out to see a very valuable four months old heifer. At 11.30 it was quite all right but at 12.30 was down and could not get up.

Examination revealed two complete fractures of both femurs at about 3 inches above the stifles.

Post-mortem showed complete separation at the fractures. There was nothing to indicate how this was done and no external injury. The animal was tied in the corner of an ordinary cow stall with a 3-foot rope from post to neck. There was no place one could find where it could have caught its feet.

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A Case of Cystic Calculi in the Bitch.

By CLIFFORD FORMSTON, M.R.C.V.S.,
Royal Veterinary College, London.

SUBJECT—Cocker spaniel bitch, four years old. HISTORY.—The bitch was admitted to the College on November 4th, 1929, with a typical history, incontinence and hæmaturia.

On manual examination, with difficulty, one could feel two " foreign bodies " in the region of the neck of the bladder, each about the size of a hazel nut. Examination per rectum gave little assistance and passing a sound via the urethra rendered none.

It was decided to have the bitch X-rayed, which failed to show anything abnormal although two attempts were made.

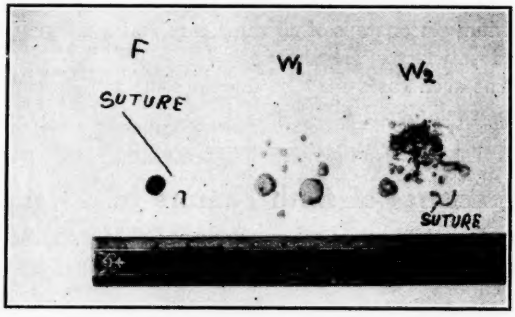
However, clinical diagnosis prevailed and the bitch was operated upon.

Operation revealed two calculi anchored to the bladder mucous membrane, near the neck, on its ventral aspect.

These were removed, a search for smaller ones made, and the bladder incision closed with Czerny Lembert sutures, using fine silk.

Recovery was uninterrupted and the bitch left the infirmary on November 25th.

On January 23rd, 1930, the owner came to the College and said the bitch was exhibiting the same symptoms as before.



Palpation revealed the presence of a calculus, slightly larger than the first, which needed no confirmation by X-rays.

Supraputic cystotomy was again performed and the calculus removed. A search for others revealed a suture from the previous operation, free in the bladder. This was studded with a number of small calculi about the size of a pin's head (F in photo).

The wounds were closed as before and the bitch made an uninterrupted recovery.

The points of interest in this case are :—

1. The rapidity of recurrence.
2. Failure to show up on X-ray examination.
3. The presence of the suture which had fallen into the bladder cavity and acted as a nucleus around which were adherent small calculi.
4. When performing the second operation the scar of the first operation was visible but there were no signs of any sutures.

The groups of calculi W1 and W2 are those of a similar case encountered by Professor Wooldridge.

First group W1 was removed from a Sealyham bitch, July 19th, 1928.

The second group was taken from the same bitch three months later, October 26th, 1928.

This patient, too, has made an excellent recovery.

The photographs were kindly taken by Mr. J. W. H. Holmes, M.R.C.V.S., D.V.S.M.

"Novasurol" in the Treatment of Ascites in the Dog.

By J. G. WRIGHT, F.R.C.V.S.,

Professor of Therapeutics and Pharmacology, Royal Veterinary College, London.

In the *North American Veterinarian* of August, 1927, Quitman and Ehle recorded the successful treatment of a case of ascites in a 2 y.o. dog by the use of Novasurol (Non-official. Sodium mercuri chlorphenyl acetate with diethylbarbituric acid and containing 33.9% of mercury).

I have used the drug in a number of cases of ascites both in the dog and cat and in two with somewhat striking results.

Case I. Eighteen months Airedale male :—The owner had noticed the commencement of the abdominal enlargement some two months previously, and at the time of examination the abdomen was greatly distended with fluid, the quantity of which, at a conservative estimate, was considerably over a gallon. There was no œdema of the dependent parts. The animal was weak and dull.

Auscultation did not reveal any valvular irregularity of the heart and no conclusion was arrived at as to the cause of the œdema.

1.2 c.c.s. of 10% solu. of Novasurol was injected intramuscularly into the gluteals, each fourth day until three doses had been given.

Ammonium chloride, grs. XV, was also given in water three times daily (as recommended by Quitman). The first injection caused no appreciable alteration in the animal's condition, but the second acted

as a most powerful diuretic there being copious urination. After the third injection the size of the abdomen was reduced to normal, there being no evidence of fluid. The animal became bright, eager for food, and there was no excessive thirst.

At this stage the animal was discharged from the College hospital and has not been seen since.

Since this time, I have, on a number of occasions, used Novasurol, in the treatment of ascites in aged dogs, associated with chronic disease of the liver or kidneys without success ; nor have I found it of use in the so-called chylous ascites of cats.

CASE II. A fifteen months Spaniel bitch :—Was brought to the outpatients' clinique on account of the great abdominal distension which had been coming on for the past few months. Abdominal ballottement revealed the distension to be due to ascites. Auscultation failed to reveal any cardiac irregularity, but in view of the bitch's age it was thought unlikely that there was any chronic disease of the liver and kidneys. There was, however, considerable respiratory distress which was so marked when the bitch exerted herself that it was necessary to instruct the house surgeon in charge of the case, to perform paracentesis at once if this distress became greater. Fortunately this was unnecessary.

Fig. 1.—Showing the Enormously Enlarged Abdomen.

1.2 c.c.s. of a 10% solu. of "Novasurol" was injected intramuscularly and 10 grains of ammonium chloride given three times daily in water. Diet comprised raw meat and milk. The animal was disinclined to feed but there was no excessive thirst. There was no appre-

ciable alteration in the abdominal distension after the first injection, but it gave rise to considerable diarrhœa together with the passage of several complete dypilidium caninum. The second injection given on the fourth day caused marked diuresis which persisted for 36 hours. The bitch literally flooded her kennel with urine and at the end of this period the whole of the fluid was removed and the abdomen was normal in size.

The two photographs illustrate the animal, the first immediately prior to the first injection and the second 48 hours after the second dose.

Fig. 2.—Photograph taken six days later.

Three weeks later we were again consulted regarding the animal, on account of its lassitude and breathlessness upon exercise. The "Novasurol" treatment was again adopted and two doses given with an interval of four days. Diuresis again occurred but it was not copious. There is no return of the ascites and the bitch is in apparent normal health, having gained two pounds body weight since the commencement of the treatment two months ago.

Discussion.—As to the cause of ascites in young dogs I have no explanation to offer. Surgical interference, i.e. tapping, is usually resorted to, but is, in most cases only of a palliative nature and in a week or so the accumulation of fluid is as great as ever.

Diuretics and cardiac tonics such as digitalis, caffeine, magnesium sulphate, potassium nitrate, potassium iodide, are recommended by some, but are usually disappointing. Mercury in the form of calomel given in small and oft repeated doses has, for many years, been recognised as a serviceable diuretic in the treatment of ascites; but the gastric and intestinal irritation it gives rise to, if persisted with, in dogs, reduces its value.

Finally, in ascites the result of chronic hepatitis or nephritis in aged animals I have not found this drug of any service.

Personal

Capt. J. L. Stewart, M.C., M.R.C.V.S., has been appointed Principal Veterinary Officer to the Gold Coast Colony on the retirement of Capt. Beale.

Mr. D. C. Fenwick, M.R.C.V.S., has been appointed Veterinary Inspector for West Glamorgan under the Glamorganshire County Council.

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OLD London Students will read with regret of the death of Mr. V. Pride-Jones, M.R.C.V.S., of Newmarket, the Veterinary Surgeon to the Jockey Club, who graduated from the Royal Veterinary College in 1909. In 1923 he crossed over to America in charge of Papyrus, the Derby winner who was beaten in the States by Zev.

MR. JOHN M'ARTHUR, M.R.C.V.S., has been appointed Assistant Veterinary Officer in Northern Rhodesia at a commencing salary of £600.

MR. DONALD MENZIES, M.R.C.V.S., has been appointed Veterinary Adviser to the University of Bristol. Mr. Menzies was a Veterinary Research Scholar of the Ministry of Agriculture.

THE Manx Government have under discussion the subject of the employment of a full-time Veterinary Officer for the Isle of Man, the duties of the office to combine those which are now carried out by several part-time officials.

MR. W. R. KERR, M.R.C.V.S., D.V.S.M., has been appointed Lecturer and Adviser in Veterinary Science to the Harper Adams College, Shropshire.

MR. NOEL BUXTON stated, in reply to Captain Crookshank on March 20th, that the Development Commissioners had recommended, and the Treasury had approved, subject to conditions, a grant not exceeding £100,000, on a pound for pound basis, to the governors of the Royal Veterinary College for reconstruction of the college on the present site.

THE Edgar Goldring Prize, in Veterinary Anatomy, of the Liverpool University School of Veterinary Science, has been won by Miss Phyllis Edwards, a student of the Veterinary School.

It is stated in the *British Australian* that a new division of animal health research, established by the Council of Scientific and Industrial Research has been placed in charge of Dr. J. A. Gilruth, former Professor of Veterinary Science, and Director of Veterinary Research Institute, at the Melbourne University. The division will supervise veterinary research work in different centres already employed on problems relating to animal conditions.

LT.-COLONEL D. O. TURNBULL, D.S.O., formerly Deputy Chief Veterinary Officer, Northern Rhodesia, has been appointed Chief Veterinary Officer, Nyassaland.

Mr. Rogan, Supervising Veterinary Inspector of the Irish Free State, is in Holland studying the working of the Dutch laws on the inspection of meat, in view of plans for the establishment of a general meat inspection in Ireland.

CAPT. JAMES BRAND, F.R.C.V.S., has again been elected as Hon. Veterinary Surgeon to the Clifton Zoo, Bristol.

MR. F. D. MACMASTER has given £20,000 for the erection of a research laboratory in animal health at the Sydney University, and the Commonwealth Government has undertaken to equip and staff same. There is a possibility, too, of another similar institution being attached to the Veterinary School.

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